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Characterization of biofilms of isolates from meat retail facilities

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According to EFSA cross contamination is implicated in about 40% of reported foodborne outbreaks, as pathogens can be transferred from several sources including raw foods during food processing to hands, cloths and food contact surfaces. Specifically, during slaughtering meat can be contaminated with bacteria directly by fecal contamination and indirectly by inadequately disinfected surfaces. This is aggravated by the persistence of foodborne pathogens due to their ability to adhere and form biofilms in surfaces despite of disinfection procedures. Besides, there is also a concern that the use of biocides may contribute to the development of antibiotic-resistant strains. Accordingly, isolates were collected from meat processing surfaces of retail facilities, isolated by selective media, identified by 16S sequencing and phenotypically characterized in terms of biofilm formation ability, susceptibility to disinfectants and antibiotics, viability and acquisition of cross-resistance. Planktonic cells showed low susceptibility to the disinfectants tested (hydrogen peroxide and sodium hypochlorite) and to antibiotics (rifampicin and linezolid). Moreover, isolates presented good biofilm formation ability and, as expected, a lower susceptibility to disinfectants and to antibiotics compared to planktonic cells. After exposure of biofilms to hydrogen peroxide at concentrations higher than the recommended ones, biofilms were still able to survive to antibiotics at a 10 x MIC. These results showed that bacteria may be exposed to only sublethal concentrations and survive which may contribute to bacterial resistance to these compounds, as well as cross-resistance to antibiotics.